UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,430	04/24/2001	Scott Lee Wellington	5659-09600/EBM	3855

7590 01/31/2003

DEL CHRISTENSEN
SHELL OIL COMPANY
P.O. BOX 2463
HOUSTON, TX 77252-2463

EXAMINER
SUCHFIELD, GEORGE A

ART UNIT	PAPER NUMBER
3672	

DATE MAILED: 01/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/841,430	WELLINGTON ET AL.	
	Examiner	Art Unit	
	George Suchfield	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *531-610,623-625,665-706 and 5150-5190* is/are pending in the application.

4a) Of the above claim(s) *535,536,576,577,610,623-625,665-706 and 5150-5190* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *531-534,537-575 and 578-609* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *531-610,623-625,665-706 and 5150-5190* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on 3/12/03 is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

1. Claims 535, 536, 576, 577, 610, 623-625, 665-706, as well as new claims 5150-5190, dependent from claims 623 and 704, stand withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 17.

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: No antecedent basis can be found in the specification for the specific pressure-temperature relationship formulas set forth in claims 571 and 572.

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 531-609 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending applications (including the present application):

09/840,936; 09/840,937; 09/841,000; 09/841,060; 09/841,061; 09/841,127; 09/841,128; 09/841,129; 09/841,130; 09/841,131; 09/841,170; 09/841,193; 09/841,194; 09/841,195; 09/841,238; 09/841,239; 09/841,240; 09/841,283; 09/841,284; 09/841,285; 09/841,286; 09/841,287; 09/841,288; 09/841,289; 09/841,290; 09/841,291; 09/841,292; 09/841,293; 09/841,294; 09/841,295; 09/841,296; 09/841,297; 09/841,298; 09/841,299; 09/841,300; 09/841,301; 09/841,302; 09/841,303; 09/841,304; 09/841,305; 09/841,306; 09/841,307;

09/841,308; 09/841,309; 09/841,310; 09/841,311; 09/841,312; 09/841,429; 09/841,430; 09/841,431; 09/841,432; 09/841,433; 09/841,434; 09/841,435; 09/841,436; 09/841,437; 09/841,438; 09/841,439; 09/841,440; 09/841,441; 09/841,442; 09/841,443; 09/841,444; 09/841,445; 09/841,446; 09/841,447; 09/841,448; 09/841,449; 09/841,488; 09/841,489; 09/841,490; 09/841,491; 09/841,492; 09/841,493; 09/841,494; 09/841,495; 09/841,496; 09/841,497; 09/841,498; 09/841,499; 09/841,500; 09/841,501; 09/841,502; 09/841,632; 09/841,633; 09/841,634; 09/841,635; 09/841,636; 09/841,637; 09/841,638; and 09/841,639.

Although the conflicting claims are not identical, they are not patentably distinct from other. For example; claim 2200, currently pending in S.N. 09/841,284 is an obvious variation of claim 564 pending herein, and claim 2239 currently pending in 09/841,284 is an obvious variation of claim 565 pending herein. More specifically, both claim 564 and 2200 call for heating a section of a formation to increase the permeability to greater than about 100 millidarcy while controlling the pressure as a function of temperature, or controlling the temperature as a function of pressure; the precise extent of formation heated, i.e., a majority of the section or a majority of a portion of the section is deemed a matter of choice or design based on, e.g., formation characteristics or economic feasibility. Similarly, both claim 565 and 2239 call for heating a section of a formation to increase the permeability substantially uniformly while controlling the pressure as a function of temperature, or controlling the temperature as a function of pressure; the precise extent of formation heated, i.e., a majority of the section or a majority of a portion of the section is deemed a matter of choice or design based on, e.g., formation characteristics or economic feasibility.

5. Claims 531-609 are specifically provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 531-609 of copending Application No. 09/841,437. Although the conflicting claims are not identical, they

are not patentably distinct from each other because the coal formation treated by the method of claim 531 and 570 of this pending application is deemed broad enough to encompass or comprise the hydrocarbon formation of claim 531 and 570 of the copending application. .

Claims 532-569 and 571-609 appear to essentially correspond to claims 532-569 and 571-609 of the copending '437 application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 531-534, 540, 542-553, 555, 556, 564 and 565 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ljungstrom (2,923,535).

Ljungstrom discloses a process for heating a coal or oil shale formation utilizing one or more heaters (22) wherein the heat imparted causes volatilization, pyrolysis and/or gasification of hydrocarbon constituents, which are subsequently produced to the surface as production fluids

or "mixture" comprising condensible hydrocarbons. Ljungstrom specifically discloses that the temperature "may be controlled depending on ... the pressure maintained or permitted to build up" (col. 2, lines 41-45). In addition, the temperature and pressure curves of Figures 10 and 11 appear to indicate a direct relationship between temperature and pressure within the coal formation. Thus, Ljungstrom inherently or obviously controls the temperature in the formation as function of pressure, as called for in claim 531.

As per claim 532, in view of the large number of heat input wellbores or "sources", relative to a recovery wellbore (26), as illustrated in Figures 2-5 and 9, it is deemed at least some overlap or "superposition" of the heat applied will necessarily or obviously occur, especially in ensuring that the entire coal formation extent is heated – which appears necessary in order to provide the "exhaust channels" (40,42) in the coal seam (col. 3, line 48 – col. 4, line 9)

As noted above, pyrolysis clearly occurs in the coal formation, as called for in claim 533; the recited temperature range therein of 270oC – 400oC is deemed to encompass the exemplary temperature range in Ljungstrom (col. 2, lines 25-42) of 100oC – 250oC for the electrical heating phase, followed by 300oF – 400oC, with any difference therebetween deemed an obvious matter of choice or design based on, e.g., the characteristics or type of the particular coal formation encountered in the field.

As per claim 540, at least a portion of the heating effected in Ljungstrom is effected "substantially by conduction", e.g., in the widening of the porous coal layer (30) (see col. 3, lines 29-36).

Regarding claims 542-553, 555 and 556 it is deemed that the myriad hydrocarbon product mixtures recited in these claims would necessarily or obviously occur in carrying out the

heating process of Ljungstrom, i.e., the precise composition of the product fluids is seen as dictated by the type of coal naturally occurring in the particular coal formation actually encountered in the field. Moreover, it would be an obvious matter of choice to operate the Ljungstrom process to minimize what would be considered refinery contaminants, such as sulfur, nitrogen and/or oxygen in the product mixtures. Similarly, it would be obvious to reduce or minimize the amount of asphaltenes in the product mixtures for optimum downstream refining. Also, in the event that the particular coal deposit encountered yields ammonia gas, it would be an obvious expedient to utilize it in a commercial process such as fertilizer production.

The heating process of Ljungstrom also causes an increase in permeability of the coal formation (note col. 2, lines 1-24). It is further deemed that such permeability increase will inherently or obviously be substantially uniform, as called for in claim 565, e.g. during an overall field heating process, as illustrated in Figures 2-5. Such permeability increase is deemed to necessarily or inherently encompass an increase to "greater than about 100 millidarcy", as called for in claim 564; alternatively, to increase the permeability to greater than 100 millidarcy would have been an obvious matter of choice in order to ensure adequate fluid flow through the formation.

As per claim 534, note the use of electrical heating elements (22) in Ljungstrom.

9. Claims 539, 541, 560, 566 and 567are rejected under 35 U.S.C. 103(a) as being unpatentable over Ljungstrom (2,923,535).

The precise heating rate recited in claim 539 is deemed obvious matters of choice or design, especially in carrying out the embodiment in Ljungstrom of controlling and/or

maintaining the temperature in the coal formation within a specific operating range (col. 2, lines 25-48)

The thermal conductivity recited in claim 541 is deemed an obvious matter of choice or design based on, e.g., the quality and type of the coal formation present and/or the matrix characteristics of the particular coal formation encountered in the field.

The steps of claims 560 and 566, such as controlling the heat or pressure in the formation, are deemed obvious matters of choice or design in carrying out the process of Ljungstrom, consistent with one of the overall objectives of Ljungstrom to control the heating process (col. 2, lines 25-55).

Regarding claim 567, Ljungstrom in the embodiment of Figures 2-5 and 9, discloses that myriad heating wellbores (20) may surround a production wellbore or shaft (26). The precise number of such heating wells provided, as called for in these claims, is deemed an obvious matter of choice or design in carrying out the process of Ljungstrom based on, e.g., the overall areal extent of the coal formation(s) encountered in exploiting an actual reservoir encountered in the field.

10. Claims 554, 558, and 559 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ljungstrom (2,923,535) as applied to claim 531 above, and further in view of Tsai et al (4,299,285).

While Ljungstrom does not disclose the presence of hydrogen in the coal heating production effluent, Tsai et al (col. 5, line 52 – col. 6, line 15) clearly discloses that gasification/volatilization products resulting from heating and/or gasifying a coal formation include hydrogen.

Accordingly, it is deemed that the volatilized/gasified coal production effluent produced in the process of Ljungstrom will obviously include a hydrogen component, as taught by Tsai et al, with the precise amount of hydrogen present, as called for in claims 554, 558, deemed an obvious expedient or matter of choice to one of ordinary skill in the art to which the invention pertains, based on, e.g., the actual intended use of the production effluent, such as a feed stream to a synthetic natural gas production facility or as process heat gas, as called for in claims.

As per claim 559, it would have further been an obvious expedient or matter of choice to monitor the production effluent of Ljungstrom for hydrogen content, especially since Ljungstrom makes specific reference to controlling the process based on, inter alia, "the products desired" (col. 2, lines 42-44).

11. Claims 554, 558, 559, 561 and 562 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ljungstrom (2,923,535) as applied to claim 531 above, and further in view of Justheim (3,766,982) .

Justheim'982 injects hydrogen into the heated coal formation to hydrogenate the volatilized/pyrolyzed hydrocarbons evolved; and the hydrogen provided may further be obtained from production fluids obtained from the coal formation (col. 3, lines 1-9).

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains, to similarly inject hydrogen into the heated coal formation in the process of Ljungstrom, e.g., in the vicinity of the recovery wellbores, and provide the hydrogen from the production effluent, as taught by Justheim, in order to effect a partial hydroconversion/hydrotreating of the volatilized, pyrolyzed and/or gasified hydrocarbons prior

to production in order to render the production effluent more suitable for further refining or above-ground processing/conversion, as called for in claims 561, 562 .

As per claims 554 and 558, in carrying out the injection of hydrogen into the coal formation to effect hydrogenation of the volatilized/pyrolyzed hydrocarbons evolved, in the modified process of Ljungstrom, the production fluids actually produced will necessarily or obviously include a partial pressure of hydrogen, with the precise amount thereof deemed an obvious matter of choice or design, based on, e.g., the particular coal formation encountered.

As per claim 559, insofar as Justheim strives to control the amount of hydrogen present throughout the process to minimize "danger of accidental explosions", it would have been an obvious expedient or matter of choice to monitor the partial pressure of hydrogen at the production well(s) using conventional or commercially-available monitoring means, in carrying out the overall process of Ljungstrom, as modified by Justheim.

12. Claim 563 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ljungstrom (2,923,535) in view of Justheim (3,766,982) as applied to claim 561 above, and further in view of Hoekstra et al (4,353,418) or Garrett (3,661,423).

It would have been obvious to one of ordinary skill in the art to which the invention pertains to further hydrogenate the partially-hydrogenated hydrocarbons produced from the heating process of Ljungstrom, as modified by Justheim'982, with hydrogen circulated or produced by the heating process of Justheim ,as taught by Hoekstra et al (note the Abstract and figure) or Garrett (col. 4, lines 50-54), in order to improve the overall quality or advance the refining/processing of the volatilized, pyrolyzed and/or gasified hydrocarbon fluids produced by

the process of Ljungstrom, as modified by Justheim'982, by fully or completing hydroconverting/hydrogenating refinement process.

13. Claims 568 and 569 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ljungstrom (2,923,535), as applied to claim 531 above, and further in view of Salomonsson (2,914,309) or Camacho et al (4,067,390).

It would have been obvious to one of ordinary skill in the art to which the invention pertains to carry out the multiple well heating embodiment of Ljungstrom (Figures 2-5 and 9) by providing or laying out the wells in a triangle, and/or repeating triangle pattern, as disclosed by Salomonsson (note Figure 3 and col. 3, lines 5-34) or Camacho et al (note Figure 8) in order to enhance the overall heating/pyrolysis effected by optimizing well location.

14. It is noted that claims 537, 538, 557 and 570-609 have been rejected only on the grounds of double patenting and/or 35 USC 112(2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Suchfield whose telephone number is 703-308-2152. The examiner can normally be reached on M-F (6:30 - 3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 703-308-2151. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

George Suchfield
George Suchfield
Primary Examiner
Art Unit 3672

gs
January 27, 2003